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DEPARTMENT OF COMMERCE

UNITED STATES BUREAU OF MINES
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BIBLIOGRAPHY OF THE METALLURGICAL WORK OF THE U. S. BUREAU OF MINES IN 1930

BY

R. S. DEAN

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A BIBLIOGRAPHY OF THE METALLURGICAL WORK OF THE U. S. BUREAU OF MINES IN 1930[1]

By R. S. Dean[2]

General Papers:

A general survey of the metallurgical work of the U. S. Bureau of Mines has been given in an article in the Missouri School of Mines Alumnus, and a somewhat more detailed review of the bureau work on lead and zinc will be found in the Mining Congress Journal. C. C. Furnas has contributed one general mathematical article.

Dean, R. S. Program of Metallurgical Investigations of the U. S. Bureau of Mines. Missouri School of Mines Alumnus, vol. 4, No. 4, 1930, pp. 7-8.

_____ Investigations of the U. S. Bureau of Mines on the Milling and Smelting of Lead and Zinc. Min. Cong. Jour., vol. 16, 1930, p. 799, 808.

Furnas, C. C. Evaluation of the Modified Bessel Function of the First Kind and Zeroth Order. Am. Mathematical Monthly, vol. 37, No. 6, 1930, pp. 282-287.

Fundamental Studies:

The systematic study of thermodynamic properties of metallurgically important substances has continued at the Pacific Experiment Station, Berkeley, Calif., and papers have appeared giving specific heat data on manganese sulphide, ferrous sulphide, calcium sulphide, silicon, arsenic, arsenic trioxide, arsenic pentoxide, antimony, antimony trioxide, antimony pentoxide, bismuth, and bismuth trioxide. A critical survey of the specific heat of water vapor has been published and a general paper on the use of these data to study metallurgical reactions.

Anderson, C. T. The Heat Capacities of Arsenic, Arsenic Trioxide and Arsenic Pentoxide at Low Temperatures. Jour. Am. Chem. Soc., vol. 52, 1930, pp. 2296-2300.

_____ The Heat Capacity of Silicon at Low Temperatures. Jour. Amer. Chem. Soc., vol. 52, 1930, pp. 2301-2304.

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1 - The Bureau of Mines will welcome reprinting of this paper, provided the following footnote acknowledgment is used: "Reprinted from U. S. Bureau of Mines Information Circular 6449."

2 - Chief engineer, metallurgical division, U. S. Bureau of Mines.

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Anderson, C. T. The Heat Capacities at Low Temperatures of Antimony, Antimony Trioxide, Antimony Tetroxide and Antimony Pentoxide. Jour. Am. Chem. Soc., vol. 52, 1930, pp. 2712-2720.

_____ The Heat Capacities of Bismuth and Bismuth Trioxide at Low Temperatures. Jour. Am. Chem. Soc., vol. 52, 1930, pp. 2720-23.

Dean, R. S. Use of Thermodynamical Data to Study the Chemical Reactions of Metallurgical Processes. Inf. Cir. 6395, Bureau of Mines, 1930, 12 pp.

Eastman, E. D. Specific Heat of Water Vapor at High Temperatures Derived from Explosion Experiments. Inf. Cir. 6337, Bureau of Mines, 1930, 16 pp.

Hincke, W. B. The Vapor Pressure of Antimony Trioxide. Jour Am. Chem. Soc., vol. 52, 1930, pp. 3869-77.

Maier, C. G. The Heat of Formation of Zinc Oxide. Jour. Am. Chem. Soc., vol. 52, 1930, pp. 2159-2170.

Ore Dressing:

The bureau has continued its investigations of grinding and classification, and three papers have appeared by Fahrenwald. One more paper by Gaudin on flotation fundamentals has appeared. A comprehensive investigation of iron ore beneficiation has been started, and papers from the Mississippi Valley Experiment Station, Rolla, Mo., have appeared covering investigations of Missouri iron ores and ores of the Cuyuna district.

Clemmer, J. B., and Coghill, W. H. An Improved Laboratory Elutriator and Its Application to Ores. Eng. and Min. Jour., vol. 129, 1930, pp. 551-554.

Coghill, Will H. The Classification and Tabling of Difficult Ores, with Particular Attention to Fluorspar. Tech. Paper 456, Bureau of Mines, 1930, 40 pp. 15 cents.

Coghill, Will H., and Anderson, C. O. Notes on Free Gangue in Tri-State Ores. Joplin (Mo.) Globe, Annual Mining Number, February 2, 1930, p. 41.

DeVaney, F. D., and Cooke, S. R. B. Laboratory Concentration of the Missouri Iron Ores of Iron Mountain and Pilot Knob. Cooperative paper of the U. S. Bureau of Mines and the Missouri School of Mines and Metallurgy, University of Missouri, Bull., vol. 11, No. 3, 1930, 38 pp.

DeVaney, F. D., and Clemmer, J. B. Concentration Tests on the Manganiferous Iron Ores of the Cuyuna District, Minnesota. Rept. of Investigations 3045, Bureau of Mines, 1930, 9 pp.

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DeVaney, F. D., and Coghill, W. H. Concentration Tests on Tailings from the Washing Plants of the Mesabi Range, Minnesota. Rept. of Investigations 3052, Bureau of Mines, 1930, 23 pp.

Fahrenwald, A. W. Grinding and Classification.- I. Batch Grinding. Rept. of Investigations 2989, Bureau of Mines, 1930, 9 pp.

_____ Grinding and Classification.- II. Batch Closed Circuit Grinding. Rept. of Investigations 2990, Bureau of Mines 1930, 11 pp.

Fahrenwald, A. W., and Staley, W. W. The Power Consumed by Rotating Disks and Other Shaped Objects in Fluid Mediums. Rept. of Investigations 3006, Bureau of Mines, 1930, 7 pp.

Gaudin, A. M., Haynes, C. B., and Haas, E. C. Flotation Fundamentals (IV). Coop. Tech. Paper 7, U. S. Bureau of Mines and University of Utah, 1930, 40 pp.

Gaudin, A. M., and Anderson, A. E. Flotation Fundamentals (V). Coop. Tech. Paper, U. S. Bureau of Mines and University of Utah, 9, 1930, 25 pp.

Iron and Steel:

The investigation on the physical chemistry of steel making has proceeded with very interesting results, which have been published in a series of papers. Blast furnace operation has also been studied, and papers published covering resistance of ores to decrepitation and studies of gas flow and heat transfer in the blast furnace. The present status of the sponge-iron process has been summarized by Barrett.

Barrett, E. P. Sponge Iron and Its Relation to the Steel Industry. Min. and Met., vol. 11, 1930, pp. 395-396. Abstract entitled "Sponge Iron Process Not a Competitor of the Blast Furnace," Iron Age, vol. 126, No. 26, 1930, p. 1901.

Furnas, C. C. Heat Transfer from a Gas Stream to a Bed of Broken Solids (II). Ind. and Eng. Chem., vol. 22, 1930, pp. 721-731.

Herty, C. H., jr. Fundamental and Applied Research on the Physical Chemistry of Steel Making. Rept. of Investigations 3054, Bureau of Mines, December, 1930, 12 pp. Metals and Alloys, vol. 1, 1930, pp. 883-889.

_____ Iron and Steel Metallurgy. Annual Survey of American Chemistry, vol. 4, 1930, pp. 160-165.

Herty, C. H., jr., Christopher, C. F., and Stewart, R. W. The Physical Chemistry of Steel Making: Deoxidation with Silicon in the Basic Open-Hearth Process. Coop. Bull. 38, U. S. Bureau of Mines, the Mining and Metallurgical Advisory Boards, and the Carnegie Institute of Technology, 1930, 172 pp.

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Herty, C. H., jr., Fitterer, G. R., and Byrns, J. M. The Physical Chemistry of Steel Making: Deoxidation of Steel with Aluminum. Coop. Bull. 46, U. S. Bureau of Mines, the Mining and Metallurgical Advisory Boards, and the Carnegie Institute of Technology, 1930, 45 pp.

Herty, C. H., jr., Gaines, J. M., Freeman, H. and Lightner, M. W. A New Method for Determining Iron Oxide in Liquid Steel. Trans. Am. Inst. Min. and Met. Engrs., Iron and Steel Division, 1930, pp. 28–38; Am. Inst. Min. and Met. Engrs. Tech. Pub. 311, 1930, 13 pp.; Abstract in Blast Furnace and Steel Plant, vol. 18, 1930, pp. 468–71.

Herty, C. H., jr., Hartgen, F. A., Heidish, J. A., Metcalf, K., Norris, F. G., and Royer, M. B. Temperature-Viscosity Relations in the Lime-Silica System. Coop. Bull. 47, U. S. Bureau of Mines, the Mining and Metallurgical Advisory Boards, and the Carnegie Institute of Technology, 1930, 27 pp.

Joseph, T. L., and Barrett, E. P. The Resistance of Iron Ores to Decrepitation and Mechanical Work. Am. Inst. Min. and Met. Eng., Tech. Pub. 372, 1930, 15 pp.

Hydrometallurgy:

The work on leaching copper ores has been continued. The outstanding development is the leaching of slimes by agglomeration.

Keyes, H. E. Innovations in Copper Leaching Employing Ferric Sulphate-Sulphuric Acid. Bull. 321, Bureau of Mines, 1930, 67 pp., 20 cents.

Sullivan, J. D. The Chemistry of Leaching Chalcocite. Tech. Paper 473, Bureau of Mines, 1930, 24 pp. 10 cents.

_____ The Chemistry of Leaching Bornite. Tech. Paper 486, Bureau of Mines, 1930, 20 pp.

_____ The Chemistry of Leaching Covellite. Tech. Paper 487, Bureau of Mines, 1930, 18 pp. 5 cents.

_____ Apparatus for Circulating Liquids. Eng. and Min. Jour., vol. 130, 1930, p. 389.

Sullivan, J. D., Oldright, G. L., and Keck, W. E. Method for Measuring Voids in Porous Materials. Rept. of Investigations 3047, Bureau of Mines, 1930, 8 pp.

Sullivan, J. D., and Towne, A. P. Agglomeration and Leaching of Slimes and Other Finely-Divided Ores. Bull. 329, Bureau of Mines, 1930, 60 pp., 15 cents.

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Manganese Investigations:

Investigation of both pyrometallurgical and hydrometallurgical methods of recovering manganese from domestic ores has been continued and progress reports have been published covering certain phases of both processes.

Davis, C. W. Dissolution of Various Manganese Minerals. Rept. of Investigations 3024, Bureau of Mines, 1930, 11 pp.

_____ The Action of Sulphur Dioxide on Manganese Oxides at Elevated Temperatures. Rept. of Investigations 3033, Bureau of Mines, 1930, 16 pp.

Healey, M. V., and Johns, A. L. Selected Bibliography and Map of Manganese Deposits of the United States by Districts. Inf. Cir. 6274, Bureau of Mines, 1930, 19 pp.

Herty, C. H., jr., Conley, J. E., and Royer, M. B. Study of High-Manganese Slags in Relation to the Treatment of Low-Grade Manganiferous Ores. Rept. of Investigations 3048, Bureau of Mines, 1930, 4 pp

Joseph, T. L., Barrett, E. P., and Wood, C. E. Experiments Demonstrate Method of Producing Artificial Manganese Ores. Am. Inst. Min. and Met. Engrs., Tech. Pub. 310, 1930, 29 pp. Extract in Iron Age, vol. 125, 1930, pp. 723-724; Blast Furnace and Steel Plant, vol. 18, 1930, pp. 631-7; Abstracted in Iron and Coal Trades Rev., vol. 120, No. 3243, 1930, pp. 686-687.

Rare and Precious Metals Investigations:

The bureau has been very active in the department of rare and precious metals, and work on a wide variety of subjects has been reported. The report on processes of extracting radium from carnotite prepared for the House Committee on Mines and Mining is to be particularly mentioned.

Doerner, H. A. Processes for Extracting Radium from Carnotite. Rept. of Investigations 3057, Bureau of Mines, 1930, 35 pp.

_____ Concentration of Chromite. Rept. of Investigations 3049, Bureau of Mines, 1930, 8 pp.

_____ The Roasting of Chromite Ores to Produce Chromates. Rept. of Investigations 2999, Bureau of Mines, 1930, 30 pp.

_____ Notes on the Determination of Molybdenum. Inf. Cir. 6335, Bureau of Mines, 1930, 3 pp.

_____ Possibilities of Production of Radium and Vanadium from Carnotite. Ind. and Eng. Chem., vol. 22, 1930, pp. 185-189.

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Keck, W. E., Oldright, G. L., and Shelton, F. K. A Method for the Determination of Cadmium in Mill and Smelter Products. Coop. Tech. Paper 12, Bureau of Mines and University of Utah, 1930, 15 pp.

Leaver, E. S., and Woolf, J. A. In Reply to Communication of E. H. Hamilton on Paper on Metallurgy of Mother Lode of California Carbonaceous Ores. Eng. and Min. Jour., vol. 130, 1930, pp. 32-33.

_____ Retreatment of Mother Lode Carbonaceous Slime Tails. Rept. of Investigations 2998, Bureau of Mines, 1930, 6 pp.

_____ Retreatment of Mother Lode (California) Carbonaceous Slime Tailings. Tech. Paper 481, Bureau of Mines, 1930, 20 pp. 5 cents.

Nonferrous Metals:

Work on lead, zinc, copper, and quicksilver has been continued. The work on the fundamentals of zinc metallurgy has been brought to completion and summarized in a bulletin by C. G. Maier.

Maier, C. G. Zinc Smelting from a Chemical and Thermodynamic Viewpoint. Bull. 324, Bureau of Mines, 1930, 93 pp. 20 cents.

_____ The Present Status of our Quicksilver Industry. Trans. Am. Inst. of Min. and Met. Engrs., 1930, pp. 299-312. Am. Inst. Min. and Met. Eng., Tech. Pub. 264, 1930, pp. 19-32.

Laboratory Apparatus and Methods:

In the course of its laboratory work, new devices are frequently evolved by the bureau. Three such improvements have been described by Maier this year and one by Head and Slavin.

Head, R. E., and Slavin, M. A New Development in the Preparation of Briquetted Mineral Grains. Coop. Tech. Paper 10, Bureau of Mines and University of Utah, 1930, 11 pp.

Maier, C. G. Magnetic Switches in Regulatory Circuits. Ind. and Eng. Chem., Analytical Ed., vol. 2, 1930, p. 258.

_____ Resistance Thermometers for Chemists. Jour. Phys. Chem., vol. 34, 1930, p. 2860-2868.

_____ Cement for Silica-Glass Joints. Ind. and Eng. Chem., Analytical Ed., vol. 2, 1930, p. 337.

Discussions:

The following discussions of papers in the technical press have been published:

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Maier, C. G. Correspondence on Page 402 of April Issue of Industrial and Engineering Chemistry Concerning Question of Decomposition of Steam by Metallic Copper. Ind. and Eng. Chem., vol. 22, 1930, p. 916.

_____ Discussion of Electrolytic Iron from Sulphide Ores, by R. D. Pike et al. Trans. Iron and Steel Div. of Am. Inst. Min. and Met. Eng., 1930, p. 344.

_____ Discussion of Am. Inst. Min. and Met. Engrs. Tech. Pub. 270, A Theory Concerning Gases in Refined Copper, by A. E. Wells and R. C. Dalzell. Trans. Am. Inst. Min. and Met. Eng., Institute of Metals Division, 1930, pp. 364-366.

A limited number of most of the Bureau of Mines reports of investigations and information circulars are available for free distribution. If you wish to obtain copies of such publications, address the Publications Section, U. S. Bureau of Mines, Washington, D. C. Bureau of Mines bulletins and technical papers can be obtained only from the Superintendent of Documents, Government Printing Office, Washington, D. C., at the prices indicated. Cooperative papers of the Bureau of Mines and a university must be obtained through application to the cooperating university. As no provision is made for supplying the Bureau of Mines with reprints of articles appearing in the technical press, such articles will have to be consulted in the journals in which they appear.

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_____ Discussion of Am. Inst. Min. and Met. Engrs. Tech. Pub. 270, A Theory Concerning Gases in Refined Copper, by A. E. Wells and R. C. Dalzell. Trans. Am. Inst. Min. and Met. Eng., Institute of Metals Division, 1930, pp. 364-366.

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